The following is claimed:

1. An electrical modular power node comprising:

a. a power bus backplane containing a plurality of bus bars at least some of which are connectable to at least one power source, each bus bar having a plurality of terminals at regular intervals along the bus bar, each terminal being in a standard position in a pattern with terminals from the other bus bars and all terminal patterns being in a standard orientation on the backplane; and

b. a plurality of functional modules, each housing at least one functional component and circuitry having at least one connector for connection to at least one terminal on a bus bar for connection to at least one load to provide output required by each load connectable to the power bus backplane and including bounding faces conforming to bounding faces of adjacent modules when also connected to the backplane, said modules providing geometrical packages for enclosing and supporting functional components, circuitry and connectors for connecting the functional component and circuitry to the terminals, the connectors facing the power bus backplane being positioned to connect with specific terminals within each pattern on the bus bars.

2. The electrical modular power node of claim 1 in which connections between each functional module and selected terminals of the bus bars on the backplane contribute to support of said modules in position relative to the power backplane and other modules.

3. The electrical modular power node of claim 2 in which the functional modules are self-connecting to the backplane, such that when a functional module is properly positioned and oriented relative to the backplane and pressed towards the backplane, the terminals and connectors self-engage and make electrical contact.

4. The electrical modular power node of claim 1 in which parallel sets of bus bars are provided in the backplane and the functional modules are shaped and sized so that faces of the functional modules conform to bounding faces of adjacent functional modules.

5. The electrical modular power node of claim 4 having module positions where some terminals on the bus bar are not to be electrically connected to a given functional module and connectors are provided which resemble those providing electrical connection but in those positions provide additional mechanical support.

6. The electrical modular power node of claim 4 in which connections between the connectors supported on each functional module and selected terminals of the bus bars of the backplane support said functional modules in position relative to the power backplane and relative to other functional modules.

7. The electrical modular power node of claim 5 in which the connectors on the functional modules are self-connecting to terminals on the backplane such that when a functional module is properly positioned and oriented relative to the backplane and pressed toward the backplane, the terminals and connectors self-engage making electrical contact.

8. The electrical modular power node of claim 4 in which at least some of bars in the same relative positions of the parallel sets of bus bars are electrically connected together.

9. The electrical modular power node of claim 8 in which at least one set of interconnected bars is connected to a power source.

10. The electrical modular power node of claim 4 in which at least some bus bars in the same relative positions of the

parallel sets of bus bars are not electrically connected together and not connected to an external power source but at least one set of bus bars is connectable to an external power source.

11. The electrical modular power node of claim 3 in which at each minimum size functional module position on the backplane there is a terminal for each bus bar in a standard pattern of configuration and orientation whereby connectors in positions opposite selected terminals engage those terminals in the power module to self-engage and contribute to support of the functional module and terminals which are not opposed by connectors are accommodated by the module configuration to permit interconnection of those terminals and connectors which are opposed to one another.

12. The electrical modular power node of claim 3 in which at each minimum size functional module position on the backplane there is a terminal for each bus bar in a standard pattern of configuration and orientation whereby terminals in positions opposite selected connectors engage those connectors in the power module to self-engage and contribute to support of the functional module and connectors which are not opposed by connectors are accommodated by the module configuration to permit

interconnection of those terminals and connectors which are opposed to one another.

13. The electrical modular power node of claim 3 in which those positions opposite terminals which are not to be connected electrically to the functional module are opposed by connectors not electrically connected in the module providing mechanical support.

14. The electrical modular power node of claim 11 in which the terminals on the bus bars of the backplane are a post and the connectors on the functional modules are spring-loaded gripping elements which yield to a post but continue to engage that post as a module is moved toward the backplane.

15. The electrical modular power node of claim 10 in which the terminals on the bus bars of the backplane are spring-loaded gripping elements and the connectors on the functional modules are a simple post, whereby the gripping elements yield to a post but continue to engage that post as the functional module is moved toward the backplane.

16. An electrical modular power node of claim 3 in which the backplane of the power module is marked to indicate

proper positioning of functional modules of minimum size whereby functional modules placed in the positions indicated but spaced away from the backplane may be moved toward the backplane for self-engaging connection of the connectors to the terminals.

17. An electrical modular power node of claim 4 in which the backplane is marked to indicate proper positioning of functional modules of minimum size whereby functional modules placed in the positions indicated but spaced away from the backplane may be moved towards the backplane for self-engaging connection of the connectors to the terminals.

18. The electrical modular power node of claim 4 in which the backplane is marked to indicate proper positioning of functional modules of minimum size whereby functional modules placed in the positions indicated but spaced away from the backplane may be moved toward the backplane for self-engaging connections of the connectors to the terminals, wherein functional modules having dimensions which have a dimension an integral multiple of the minimum size may also be accommodated by providing at least one set of connectors on the functional module in the pattern orientation corresponding to at least part of one pattern and orientation of terminals on the backplane

and wherein other terminals at other positions on the backplane are accommodated by design of the module.

19. The electrical modular power node of claim 18 in which all positions on the larger than minimum size functional module which correspond to the terminal positions on the backplane are provided with electrical connectors or non-electrical connectors which engage all of the terminals on the backplane opposite the larger module and, therefore, further contribute to its support.

20. The electrical power node of claim 4 in which at least some functional modules are directly electrically interconnected through connections on opposed functional module faces other than those facing the backplane.

21. The electrical power node of claim 9 in which at least some functional modules are directly electrically interconnected through connections on opposed module faces other than those facing the backplane.

22. The electrical power node of claim 21 in which connectors are supported on a sidewall face of a functional module and terminals positioned to mate with the connectors are positioned on an opposed sidewall face of another functional module.

23. The electrical power node of claim 22 in which the respective connectors are self-connecting and in predetermined patterns, orientation and position on the sidewalls so that when the sidewalls are moved together with the modules in predetermined position the connections self-connect, electrically connecting active electrical connections and their respective circuitry together.

24. The electrical power node of claim 21 in which the respective connectors are supported on opposed faces parallel to the backplane of functional modules enabling the functional modules to be stacked away from the backplane so that the outer module is supported on the inner module at least in part by engagement of their respective electrical terminals and connectors.

25. A power node control center of modular construction for use in an electrical power distribution system comprising:

a. a power bus backplane having a plurality of substantially co-planar bus bars for carrying electrical power;

b. a plurality of functional modules each contained in a parallelepiped-shaped housing adapted for complementally contacting fitting with other ones

of said functional modules and with said backplane, at least some of said functional modules comprising at least one of rectifying means, switching means, voltage conversion means, voltage regulation means, pulse and other wave form generation means, voltage transformation means and/or power sensing and limiting means;

c. a control module contained in a parallelepiped-shaped housing adapted for complementally contacting fitting with at least one of said functional modules and with said backplane, comprising:

i. programmable microprocessor means for controlling operation of at least one of said functional modules according to preselected instructions and operating and performance criteria including at least one of voltage and current limits, voltage polarity, surge criteria, temperature limits, humidity limits, shock limits and alternating current phase parameters; and

d. plug-compatible means on said backplane and at least one of said functional modules for electrically connecting a selected functional module to said bus bars of said backplane.

26. A power bus backplane comprising:

a. at least two bus conductors arranged generally parallel to one another;

b. rigid terminal means connected to each of the bus conductors at regular intervals representing the dimensions of the standard module and positioned in the same repetitive pattern;

c. a resinous material cast about the conductors and supporting the connection and rigid terminals thereby; and

d. connectors placed in exactly corresponding locations on a standard surface of the module being connectable to the terminals of the bus bar.

27. The bus backplane of claim 26 in which cooperating terminals on the module and on the bus plane include one terminal in each pair as a self-engaging connector so that the module and backplane fit together upon being positioned and pressed together.

28. The power bus backplane of claim 27 in which the bus conductors are strips side by side.

29. The power bus backplane of claim 28 in which means is provided to connect power to the bus connectors.

30. The power bus backplane of claim 27 in which the bus bar conductors are placed in a stacked array and terminals for the bus conductor on the bottom pass through the hole in the bus conductor on the top with insulation therebetween.

31. The power bus backplane of claim 27 in which in addition to conductors to terminals passing through holes in at least one bus conductor at least two other conductors pass through holes in at least two parallel stacked bus conductors and are insulated therefrom in order to provide terminals on both sides of the bus plane.

32. The bus plane of claim 31 in which the bus conductors which are stacked are repeated side by side so that there are columns of stacked bus conductors with regular columns of terminals for receiving modules at regular intervals along the column.

33. The backplane of claim 32 in which the bus conductors are sheets almost the dimension of the backplane stacked one on top of another with terminals of at least one penetrating the other conductor at regular intervals both in columns and rows.

34. The backplane of claim 33 in which at each terminal pattern there is at least one conductor extending through both bus conductors in holes larger than the conductor passing through and insulated therefrom and provided with terminals on both sides of the bus plane.

Add A5

Add A12

Add B1

Add C1